

Application No. 10/611,849
Amendment dated July 30, 2004
Reply to Office Action of May 6, 2004

AMENDMENTS TO THE CLAIMS:

Kindly replace the previous claim set with the claim set which appears below, in which Claims 33, 35, 36, 40 and 41 have been amended to read as follows:

Claims 1 - 32. (Cancelled).

33. (Currently Amended) A curable one-part epoxy resin composition, comprising:

- (a) an epoxy component comprising at least one epoxy compound which has two or more groups per soluble;
- (b) a latent hardener component;
- (c) a thixotropy-conferring component; and
- (d) [at least one solid organic] barbituric acid [substantially insoluble in a mixture of (a), (b) and (c) above, at room temperature within the range of about 15°C to 35°C and which remains substantially insoluble in effective amounts at temperatures below the activation temperature at which cure of the composition is initiated].

34. (Original) The composition according the Claim 33, suitable for use as an adhesive to mount electronic components.

35. (Currently Amended) The composition according to Claim 33, comprising:

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(a) about [150] 100 parts of an epoxy component comprising at least one epoxy compound;

(b) about [42.36] 5-45 parts of a latent hardener component;

(c) about [19.26] 5-40 parts of a thixotropy-conferring component; and

(d) about [1] 0.1-25 parts of [a solid organic] barbituric acid [component].

36. (Currently Amended) The composition according to Claim 33, comprising:

(a) about [171.67] 100 parts of an epoxy component comprising at least one epoxy compound;

(b) about [42.36] 10-20 parts of a latent hardener component;

(c) about [19.26] 15-25 parts of a thixotropy-conferring component; and

d) about [1] 0.1-25 parts of [a solid organic] barbituric acid [component].

37. (Withdrawn) The composition according to Claim 33, further comprising a polythiol component.

38. (Withdrawn) The composition according to Claim 37, comprising:

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- (a) about 100 parts of an epoxy component comprising at least one epoxy compound;
- (b) about 25 parts of a latent hardener component;
- (c) about 15.6 parts of a thixotropy-conferring component;
- (d) about 75 part of a polythiol component; and
- (e) about 0.5 parts of a solid organic acid component.

39. (Withdrawn) The composition according to Claim 37, comprising:

- (a) about 130.26 parts of an epoxy component comprising at least one epoxy compound;
 - (b) about 33.26 parts of a latent hardener component;
 - (c) about 20.57 parts of a thixotropy-conferring component;
 - (d) about 94.5 parts of a polythiol component;
- and
- (e) about 0.635 parts of a solid organic acid component.

40. (Currently Amended) The composition according to Claim 33, comprising:

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(a) an epoxy component comprising at least one epoxy compound;

(b) a latent hardener component;

(c) a thixotropy-conferring component; and

(d) [a solid organic] barbituric acid

[component], wherein the composition has a yield point in the range of about 30-700 Pa, and a viscosity in the range of about 1 to 50 Pa.s, with each of which being maintained substantially within the respective ranges over time at which cure of the composition is initiated.

41. (Currently Amended) A process for preparing a curable one-part epoxy resin composition, comprising the steps of:

combining initially (i) an epoxy component comprising at least one epoxy component, (iii) a thixotropy-conferring component, and (iv) [a solid organic] barbituric acid [component],

combining thereafter (ii) a latent hardener component, and

mixing together components (i), (ii), (iii) and (iv) for a time sufficient to form the curable one-part epoxy composition.

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42. (Withdrawn) A process for preparing a curable one-part epoxy resin composition, comprising the steps of:

combining initially (i) an epoxy component comprising at least one epoxy component, (iii) a polythiol component, and (iv) a solid organic acid component,

combining thereafter (ii) a latent hardener component, and

mixing together components (i), (ii), (iii) and (iv) for a time sufficient to form the curable one-part epoxy composition.

43. (Withdrawn) A mounting structure for semiconductor devices, comprising:

a semiconductor device comprising a semiconductor chip mounted on a carrier substrate, and a circuit board to which the semiconductor device is electrically connected, wherein the space between the carrier substrate of the circuit board and the semiconductor device is sealed with the cured product of a composition according to Claim 33.

44. (Withdrawn) A mounting structure for semiconductor devices, comprising:

a semiconductor device comprising a semiconductor chip mounted on a carrier substrate, and a circuit board to which the semiconductor device is electrically connected, wherein the

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space between the carrier substrate of the circuit board and the semiconductor device is sealed with the cured product of a curable one-part epoxy composition comprising:

(i) at least one epoxy compound which has two or more groups per soluble;

(ii) a latent hardener component;

(iii) a polythiol component; and

(iv) at least one solid organic acid

substantially insoluble is a mixture of (i), (ii) and (iii) above, at room temperature within the range of about 15°C to 35°C and which remains substantially insoluble in effective amounts at temperatures below the activation temperature at which cure of the composition is initiated.

45. (Withdrawn) An electronic device comprising a semiconductor device and a circuit board to which said semiconductor device is electrically connected, assembled using a composition according to Claim 33 to mount the semiconductor device to the circuit board.

46. (Withdrawn) An electronic device comprising a semiconductor device and a circuit board to which said semiconductor device is electrically connected, assembled using a curable one-part epoxy composition comprising:

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(a) at least one epoxy compound which has two or more groups per soluble;

(b) a latent hardener component;

(c) a polythiol component; and

(d) at least one solid organic acid

substantially insoluble is a mixture of (a), (b) and (c) above, at room temperature within the range of about 15°C to 35°C and which remains substantially insoluble in effective amounts at temperatures below the activation temperature at which cure of the composition is initiated to mount the semiconductor device to the circuit board.

47. (Withdrawn) A method of using a composition according to Claim 33, the method comprising the steps of:

dispensing onto an appropriate location on a carrier substrate a sufficient amount of the composition;

positioning over the location bearing the composition an electronic component;

mating the electronic component with the carrier substrate; and

exposing the mated electronic component/carrier substrate assembly to conditions favorable to effect cure of the composition.

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48. (Withdrawn) A method of using a composition comprising:

(a) at least one epoxy compound which has two or more groups per soluble;

(b) a latent hardener component;

(c) a polythiol component; and

(d) at least one solid organic acid

substantially insoluble is a mixture of (a), (b) and (c) above, at room temperature within the range of about 15°C to 35°C and which remains substantially insoluble in effective amounts at temperatures below the activation temperature at which cure of the composition is initiated, the method comprising the steps of:

dispensing onto an appropriate location on a carrier substrate a sufficient amount of the composition;

positioning over the location bearing the composition an electronic component;

mating the electronic component with the carrier substrate; and

exposing the mated electronic component/carrier substrate assembly to conditions favorable to effect cure of the composition.

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49. (Withdrawn) A method of underfilling a space between an electronic component and a carrier substrate the electronic component being mounted on the carrier substrate, comprising the steps of dispensing an amount of a composition according to Claim 33 into the space between the electronic component and the carrier substrate; and

exposing the composition to conditions which effect cure.

50. (Withdrawn) A method of underfilling a space between an electronic component and a carrier substrate the electronic component being mounted on the carrier substrate, comprising the steps of:

dispensing an amount of a curable one-part epoxy composition comprising:

(a) at least one epoxy compound which has two or more groups per soluble;

(b) a latent hardener component;

(c) a polythiol component; and

(d) at least one solid organic acid

substantially insoluble is a mixture of (a), (b) and (c) above, at room temperature within the range of about 15°C to 35°C and which remains substantially insoluble in effective amounts at temperatures below the activation temperature at which cure of

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the composition is initiated, into the space between the
electronic component and the carrier substrate; and
exposing the composition to conditions which effect
cure.